Trigonometry - Practice test 2

Name: _____ Date: _____

10 questions | 60 marks | 75 minutes

Use exact circular measures and explain why solutions are accepted or rejected.

A scientific calculator may be used.

1. A right triangle has hypotenuse 25 cm and one leg 7 cm. [6 marks]

(a) Find the other leg and the angle opposite 7 cm to one decimal place. [3 marks]

(b) State the three ratios for that angle. [3 marks]

2. A triangle has sides 9 cm and 13 cm with included angle 50°. [6 marks]

(a) Find the third side to two decimal places. [3 marks]

(b) Find its area to two decimal places. [3 marks]

3. Triangle ABC has $A = 25^\circ$, $a = 6$ cm and $b = 9$ cm. [6 marks]

(a) Find every possible B to one decimal place. [3 marks]

(b) Find corresponding C values. [3 marks]

4. A triangle has sides 5 cm and 12 cm enclosing an obtuse angle C. Its area is 15 cm². [6 marks]

(a) Find C. [3 marks]

(b) Find the third side exactly. [3 marks]

5. A sector has angle $\frac{5\pi}{6}$ and arc length 10π cm. [6 marks]

(a) Find its radius and area exactly. [4 marks]

(b) Find the area of the complementary major sector. [2 marks]

6. Use the unit circle. [6 marks]

(a) Find $\cos(\frac{7\pi}{6})$ and $\tan(\frac{3\pi}{4})$ exactly. [3 marks]

(b) Given $\sin\theta = \frac{12}{13}$ in quadrant II, find $\cos\theta$ and $\tan\theta$. [3 marks]

7. Consider $f(x) = -1 + 2\sin(3x)$. [6 marks]

(a) State amplitude, midline and period. [3 marks]

(b) Find all maxima for $0 \leq x < 2\pi$. [3 marks]

8. Solve each equation. [6 marks]

(a) $\tan(2x) = 1$ for $0 \leq x < \pi$. [3 marks]

(b) $2\cos^2 x - 1 = 0$ for $0 \leq x < 2\pi$. [3 marks]

9. A rotating arm’s endpoint has height $h = 9 + 4\sin(\frac{\pi t}{5})$ metres, t in seconds. [6 marks]

(a) Find its range, period and first maximum time. [3 marks]

(b) Find the first positive time when $h = 7$. [3 marks]

10. A circular running track has radius 30 m. A runner travels at 3 m/s. [6 marks]

(a) How many radians does the runner turn through in 20 s? [3 marks]

(b) Find the time for one full lap and explain the unit conversion. [3 marks]